



## PROVINCE OF BRITISH COLUMBIA.

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DEPARTMENT OF AGRICULTURE (HORTICULTURAL BRANCH).

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### PROPAGATION AND SELECTION OF NURSERY STOCK.

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THE propagation of nursery stock is a business which is largely confined to nurserymen. Although this is the case, there is no reason why a fruit-grower with a little study and practice cannot grow some stock, if he so desires. It is not the intention of the writer to give this circular to the public to take business away from the *bona-fide* nurseryman, but it is written with the intention of assisting any interested party or parties who desire to propagate nursery stock either for pleasure or profit, or both. It would not only be inadvisable, but impossible, to drive the nurseryman out of business, as: (1.) The majority of fruit-growers are willing to allow the nurseryman to grow their stock, providing the prices charged are reasonable and the grade of trees is satisfactory. (2.) This is an age of specialization, and the nurseryman is better equipped, and in a better position to grow stock, than the average grower is, as the latter has his orchard-work to attend to during the year, at a time when the nursery-work requires attention. It will be possible here to give only a brief outline of a few of the more common methods of propagation of large and small fruits, ornamental and shade trees.

No variety of fruit will come true to name from seed, so it is necessary in the case of the fruits to grow the seedling tree, and insert in or on it a scion or bud of the variety which is desired. Besides propagation by budding and grafting, which are the two most common methods, some fruits are propagated by wood-cuttings, root-cuttings, layering, and from runners or cuttings. A great many of our shade and ornamental trees are propagated from the seed.

#### BUDDING.

Budding is practised during the growing season when the bark slips well, just after the buds on the same season's shoots are well formed. In the propagation of fruit-trees, the buds are cut from bud sticks or branches taken from the best trees of the varieties which it is desirous of propagating. Well-developed buds only should be used. They are inserted just under the bark (next the cambium layer), in a T-shaped cut made in the stock, and tied there with raffia or string. They are left in this condition until a good union

results. The string is then cut, the bud remaining dormant until the following spring. In the spring the top of the tree is cut off just above the inserted bud, and the new tree allowed to grow from this single bud of the variety you are desirous of propagating. The most important points to note, to obtain successful results in budding, are: (1) Keep your knife sharp; (2) use only well-matured buds; and (3) bud when the sap is running well. Propagation by budding is made use of in the case of apples, pears, and stone-fruit, roses, etc.

#### GRAFTING.

##### WHIP-AND-TONGUE GRAFTING.

Grafting is practised during the dormant season. In nursery-work, the seedlings, which are either purchased or grown in the nursery from the seed, are dug up in the fall and are grafted during the winter. These are set out the following spring in the nursery rows. The whip-and-tongue method of grafting is generally practised. A sloping cut is made on the scion and stock, and a split is made about the centre of each slope. These two "tongues" are fitted into each other, and the whole tied with raffia or string. Care must be exercised to have the growing layers (i.e., the cambium layers) of the scion and stock placed opposite on one of the sides of the graft at least, as this is the only point where a union can take place.

#### WOOD-CUTTINGS

This method of propagation is practised with all currants, grapes, gooseberries, willows, poplars, etc. Obtain in the fall or spring well-matured wood of the previous season's growth. It is preferable to gather this in the fall, as, if the buds are allowed to swell, the results will not be as good. Cut this wood into lengths of 7 to 10 inches, according to the distance apart the buds are on the cuttings. Cut the lower end off square just below a bud and leave an inch of wood above the upper bud on the cutting. Tie these cuttings in bundles, and store them, preferably upside down in moist sand or sawdust in a cool cellar. They are left in this condition during the winter. The cuts will have callused during the winter, and when set out in the spring will start growth immediately. In planting them in the nursery row, plant them about 4 inches apart in rows. Leave one or two feet between the surface of the soil, and pack the earth well around the cuttings.

#### MOUND-LAYERING.

Mound-layering is practised with gooseberries, currants, etc. It consists in mounding up the bush in the spring or summer with earth until the greater part of the bush is covered. This banking of earth causes the lower branches to take root. These are cut away from the main bush and made use of in setting out new plantations.

#### TIPPING.

This is practised to propagate the black-cap raspberries, dewberries, logans, etc. The plants produce long, drooping branches, which bend over and touch the ground. These tips will often take root themselves, but they are more liable to root if a little soil is thrown over them about August or September. These tips when rooted are severed from the parent plants and serve as new plants.

**ROOT-CUTTINGS.**

This is practised principally with blackberries, dewberries, etc. Dig up the medium-sized roots in the fall or spring of the year, and cut them into lengths of 2 or 3 inches. Plant these out 2 inches deep and 3 to 4 inches apart in well-prepared soil.

**SUCKERING.**

This is the method by which the red raspberries are usually propagated. The suckers or sprouts are dug from the bearing patch either in the fall or spring of the year. These will serve for use in the new patch.

**RUNNERS.**

Strawberries are propagated from runners. These can be made to root quicker in some soils by covering the joints of the runners with a little soil, or by placing a stone on them near the joints.

**SEEDS.**

The stock which is used in the propagation of the tree-fruits is grown principally from seed, and is called a seedling. The seeds are either sown in the fall, or they are stratified (frozen) in boxes of sand during the winter, and then sown in the spring.

New varieties of apples, pears, peaches, currants, berries, etc., can be grown from the seed of the fruit or berries. It is seldom that a good variety is obtained in this manner. Many of the shade and ornamental trees, such as maples, oak, elms, locust, catalpa, ash, and evergreens, can be grown from the seed. The evergreens are rather difficult to start, as the seedlings require shade, etc., but they can be grown by using proper care.

**SELECTION OF NURSERY STOCK.**

The careful selection of nursery stock is an important consideration in the planting of an orchard. At this time the grower is laying the foundation of his orchard, and the results of a poor selection at that time will magnify greatly as the orchard grows older. The best grade of nursery stock, although the most costly, will prove the cheapest in the end. It is advisable to order the stock early, so as to secure the best stock of the varieties that are to be planted.

The nurseryman's obligations to the grower are: (1) That he supply varieties true to name; (2) that he supply clean, healthy, vigorous, *well-matured stock*; (3) that he be careful in the digging, storing, and packing of his stock; (4) that he be prompt in sending out orders, and be careful to have it well packed, and shipped during seasonable weather; (5) that he has placed the necessary bonds with the Government as a protection to those who buy his trees; and (6) that all his agents have secured the licence which is required of them by the Government.

The buyer's obligations to the nurseryman are: (1) That he call for the stock immediately on its arrival at the point of delivery; (2) that he carefully handle and protect the stock until it is planted; and (3) that he is careful in preparing the soil and in setting out the trees.

**HOW TO HANDLE STOCK.**

Stock often reaches the grower in good condition, but, through careless handling on his part, the stand obtained is not satisfactory, and the nursery-

man as a rule receives the blame. This is unjust, and could easily be prevented if only the following few precautions are observed: When the stock is received, cut the strings, loosen the bundle, and then heel in moist, well-drained soil. This should be left in a condition so it will remain fresh until planting-time. It is not a good practice to place the stock in water. And under no condition should the roots be left exposed to the sun and wind. If trees arrive in a dried-out condition, they should be entirely buried in moist soil until they regain their turgidity. If the stock is frozen when received, place it in a location where it will thaw out gradually. Should the stock be received in the fall, and the fruit-grower does not wish to plant it until spring, it should be well heeled in, covering the roots to a depth of about 18 inches, and tapering this down to only a few inches over the tops. If the district is subject to very low temperatures, it would be advisable to supplement the above covering by means of straw, or evergreen branches. Before heeling in the trees in the fall, it is a good practice to prune all the roots, as by so doing a callus will be formed on the cuts by spring, and new roots will grow from this callus immediately after planting.

#### WHERE TO PURCHASE NURSERY STOCK.

Always deal with reliable, established, and responsible nurserymen or their accredited agents. Select those who are growing their stock under, as near as possible, your own conditions of soil and climate. Use your best judgment, supplemented by the advice of your most successful neighbours and that of your local Horticulturist, as to the varieties best suited for planting in your section. The grower is warned against planting heavily any extensively advertised varieties until they have been proven successful in the district, both from the standpoint of market requirements and adaptability to the district.

#### AGE OF TREE TO PLANT.

One-year-old fruit-trees are the most satisfactory for planting in all cases. There should be no difficulty met with in obtaining a good stand, providing the stock is good and the ground is in proper condition to receive them. A one-year-old tree can be headed at any height desired by the grower. In the case of two-year-old trees, most of the nurserymen sell them according to height, so they are tempted to head them much higher than would a good orchardist. One-year-old trees from the nursery as a general rule have a better root system in proportion than older trees. The older tree has to be cut back more severely after planting, or it will make little growth, and will form fruit-spurs and rosettes of leaves, which are not to be desired on the young tree just planted. In most cases it is found that a tree set at one year of age in a comparatively few years will equal and surpass a tree which has been set at two, three, or four years of age. The older trees receive a much greater check on transplanting than do the younger trees. The initial cost of the older trees is greater, there is also greater expense in handling and in shipping, and more time is required in setting a tree of this kind. Furthermore, the percentage from loss is considerably greater, because the older trees are much more difficult to establish. A careful perusal of the above should be enough to convince the reader as to the superiority of the one-year-old tree for planting. We must favour the planting of one-year-old trees. There may be cases where an older and larger tree could be moved a short distance, and, by taking great care in planting, be made to grow well. This, however, can

only be recommended where a few trees for the home garden are concerned, and where expense and time are not so important as the early bearing of the trees.

#### **GRADES OF ONE-YEAR-OLD STOCK AND THEIR PROPAGATION.**

Nursery stock (large fruits) is graded and sold according to the standard height of the trees for the particular variety. Trees are either propagated by grafting or budding.

##### **ONE-YEAR-OLD GRAFTED STOCK.**

The seedlings for grafting are dug in the fall, grafted during the winter, and set out in the spring. These grafts after one season's growth are sold as one-year-old grafts, and consist of a one-year-old top on two-year-old roots. The tops of these trees are generally unbranched.

##### **ONE-YEAR-OLD BUDDED STOCK.**

The seedlings for budding are either left in the nursery row all winter, or are dug up in the fall and stored and set out in the spring. These are budded during July or August. The buds do not make any growth the same season as budded, but remain dormant until spring, when the tops of the trees are cut off just above the inserted bud. After one season's growth from this bud, the stock is sold as one-year-old budded stock, and consists of a one-year-old top on a three-year-old root. These trees are stronger than the one-year-old grafts, and are generally more or less branched. Nearly all our stone-fruits and a great many of our apples and pears are propagated in this manner.

##### **CUT-BACK GRAFTS.**

There is still another class of tree which is sold by nurserymen, and which is known as the one-year-old cut-back graft. This stock is obtained by cutting back the one-year-old graft in the spring to the lowest bud on the previous season's growth, and then allowing this tree to grow another season in the nursery row. At the end of the season the stock is sold as one-year-old cut-back stock, and consists of a one-year-old top on a three-year-old root system. These cut-back grafts are similar to the budded tree, except that they have a greater development of side branches, which is a great advantage in framing the head of the tree. This factor will be more fully dealt with under pruning the tree at the time of planting.

##### **BUDDED VERSUS GRAFTED TREES.**

There is a difference of opinion as to which is the better to plant, the grafted or budded tree. Possibly the grafted tree is a little more hardy than the budded tree, because the seedling part of the grafted tree is buried in the ground. It is a noticeable fact that in the nurseries the seedling trees will be killed down during a hard winter, while the propagated stock in the same nursery will be uninjured, thus showing that the wood of many seedling trees is more tender than that of the propagated varieties. With this fact in view, the grafted tree should prove more successful in the colder sections of the Province. In general, however, there is little to choose between the two for planting in the average district.

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